

RECEIVED

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

FEB 14 1997

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of	)	
	)	
Access Charge Reform	)	CC Docket No. 96-262
	)	
Price Cap Performance Review for Local Exchange Carriers	)	CC Docket No. 94-1
	)	
Transport Rate Structure and Pricing	)	CC Docket No. 91-213
	)	
Usage of the Public Switch Network by Information Service and Internet Access Providers	)	CC Docket No. 96-263
	)	

REPLY COMMENTS OF  
THE ALARM INDUSTRY COMMUNICATIONS COMMITTEE

Alarm Industry  
Communications Committee

Benjamin H. Dickens, Jr.  
Gerard J. Duffy  
Susan J. Bahr

Blooston, Mordkofsky,  
Jackson & Dickens  
2120 L Street, N.W.  
Washington, D.C. 20037  
(202) 659-0830

Its Attorneys

February 14, 1997

No. of Copies rec'd 0+16  
List ABCDE

## TABLE OF CONTENTS

SUMMARY . . . . .	ii
REPLY COMMENTS . . . . .	1
I.    INTEREST OF AICC . . . . .	2
II.   ACCESS CHARGES SHOULD NOT BE IMPOSED ON ALARM SERVICES . . . . .	3
A. CONGRESSIONAL POLICY DICTATES AGAINST IMPOSING ACCESS CHARGES ON ALARM COMPANIES . . . . .	3
B. THE USE OF THE PSTN BY ALARM COMPANIES IS MUCH LOWER THAN THE USE OF THE PSTN BY OTHER ESPS .	10
C. IMPOSITION OF ACCESS CHARGES WOULD BE PREMATURE . . . . .	11
III. SUBSCRIBER LINE CHARGES SHOULD REMAIN CAPPED AND ASSESSED ON A PER-FACILITY BASIS . . . . .	12
CONCLUSION . . . . .	14
EXHIBIT . . . . .	15

## SUMMARY

The Alarm Industry Communications Committee (AICC) opposes the imposition of access charges on alarm companies and other enhanced service providers, opposes lifting the existing caps on the subscriber line charge (SLC), and supports the assessment of only one SLC per pair of copper wires or Basic Rate Interface (BRI) ISDN line.

Imposing access charges on alarm companies would be counter to the goals and policies that Congress embraced when it adopted the alarm provisions of the Telecommunications Act of 1996. As predominantly small businesses, alarm companies represent a vital and important part of the country's economy, creating jobs, supporting local communities, and engaging in the energetic competition that was the goal of the Act and which serves the public interest.

In addition, the alarm services industry is a highly efficient user of the public switched telecommunications network (PSTN). In the interest of public safety and security, alarm companies have every incentive to process calls quickly and reliably and reduce holding times to a minimum. As a result, their overall use of the PSTN is significantly lower than that of Internet access providers.

Despite this low usage rate, the alarm industry is nonetheless highly dependent on the telecommunications infrastructure. Imposition of access charges would seriously impact the economic viability of thousands of small companies

whose margins are already thin. The results would be either higher prices to consumers, with no corresponding benefit, or a shake-out among alarm companies and diminished competition.

For much the same reasons, the AICC also opposes lifting the existing caps on the SLC. Congress's intent would be defeated if ESPs continued to be exempt from access charges, only to be whipsawed by higher SLCs imposed by monopoly LECs seeking an easy way to further bolster their revenues. In addition, AICC supports the assessment of SLCs on a per-facility basis. To charge for BRI ISDN access or other derived-channels on a per channel basis would violate the principles of cost-causative pricing and would inhibit the development of technical advances in alarm monitoring, such as video monitoring and single-line audio and data transmission.

In the interest of public safety and convenience, as well to preserve the vitality of an important economic sector, the Commission should continue its current practice of exempting ESPs from access charges, maintain the existing cap on the SLC, and prohibit LECs from assessing more than one SLC for each BRI ISDN line or pair of copper wires.

RECEIVED

FEB 14 1997

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of	)	
	)	
Access Charge Reform	)	CC Docket No. 96-262
	)	
Price Cap Performance Review	)	CC Docket No. 94-1
for Local Exchange Carriers	)	
	)	
Transport Rate Structure	)	CC Docket No. 91-213
and Pricing	)	
	)	
Usage of the Public Switch	)	CC Docket No. 96-263
Network by Information Service	)	
and Internet Access Providers	)	

REPLY COMMENTS OF  
THE ALARM INDUSTRY COMMUNICATIONS COMMITTEE

The Alarm Industry Communications Committee (AICC), by its attorneys, respectfully submits its reply comments with respect to the Commission's Notice of Proposed Rulemaking, Third Report and Order, and Notice of Inquiry (Access Charge Reform), CC Docket No. 96-262, FCC 96-488, released Dec. 24, 1996 [hereinafter NPRM, Third Report and Order, and NOI].

The AICC requests the Commission to refrain from imposing interstate access charges on enhanced service providers (ESPs), including alarm companies. AICC also requests the Commission to retain the existing caps on the subscriber line charge (SLC) and to establish a rule that would prohibit local exchange carriers (LECs) from assessing more than one SLC for each pair of copper wires or each ISDN facility. Many commenters in the initial

round<sup>1</sup> agree with these requests, which are consistent with the Congressional goal of supporting the vitality of the alarm industry as it provides public safety services via thousands of small businesses throughout the country. Furthermore, these requests are based on the comparatively low use of the public switched telephone network (PSTN) by alarm systems. This controlled usage of the PSTN is a consequence of the need for alarm companies to ensure that the lines to their central stations are available to respond to emergency calls.

These issues are discussed below. AICC plans to file more extensive comments in response to the NOI in this proceeding.

#### **I. INTEREST OF AICC**

AICC is a subcommittee of the Central Station Alarm Association. Its members consist of ADT Security Systems, Inc.; Holmes Protection Group, Inc.; Honeywell Protection Services; L.T. Fiore, Inc.; National Burglar and Fire Alarm Association; Rollins Protective Services, Inc.; Security Industry Association; Security Network of America; and Wells Fargo Alarm Services. The AICC membership represents a large majority of the alarm security services provided throughout the United States.

Alarm companies are ESPs and therefore would be affected by

---

<sup>1</sup> E.g., Information Industry Association (IIA) Comments at 2-4; Interactive Services Association (ISA) Comments at 1-3; Pennsylvania Internet Serv. Providers Comments at 21-27; American Petroleum Inst. Comments at 45; GTE Comments at 32-33. See also Letter from Commercial Internet Exchange to Reed Hundt, Dec. 19, 1996, at 1.

the Commission's decision concerning the imposition of access charges on ESPs. Additionally, alarm companies and their customers use derived channels and ISDN service, and would be affected by the Commission's decisions on SLC caps and on the number of SLCs to be applied to derived channels and ISDN lines.

**II. ACCESS CHARGES SHOULD NOT BE IMPOSED ON ALARM SERVICES**  
**[NPRM paras. 282-290]**

AICC opposes the imposition of access charges on alarm companies because it would be contrary to Congressional policy, inconsistent with the low usage of the PSTN by alarm companies, and procedurally premature. These issues are discussed in turn.

**A. CONGRESSIONAL POLICY DICTATES AGAINST IMPOSING ACCESS CHARGES ON ALARM COMPANIES**

One Congressional goal in adopting the Telecommunications Act of 1996 (1996 Act) was to support the continued vitality of the alarm monitoring services industry. In Section 275 of the Communications Act of 1934, as amended, Congress provided a waiting period during which Bell Operating Companies are prohibited from expanding into new alarm monitoring businesses.<sup>2</sup> As discussed below, the Congressional reasons for adopting this alarm provision also require the Commission to refrain from imposing access charges on alarm companies.

---

<sup>2</sup> 47 U.S.C. § 275.

1. MOST ALARM COMPANIES ARE SMALL BUSINESSES

First, in adopting new Section 275 of the Communications Act, Congress noted the small size of alarm companies, their contribution to the American economy, and the vibrant competition that exists within the alarm industry. Senator Harkin explained:

I know that most of my Senate colleagues share my belief that small business people are the backbone of both the economic and community life of this country. We know that the small business people in our villages, towns and cities back home help to provide neighborhood stability and pride by being the individuals who can be depended upon to participate in community affairs, and we all know small businesses are where the jobs are created.

Today, in the midst of these great battles among corporate titans like the Baby Bells, the major long distance carriers, the large cable television companies and the large broadcasters, this amendment helps the little person. . . .

Now, some of my colleagues might ask why we are doing this. . . . First of all, the burglar and fire alarm industry is unique. It is the only information service which is competitively available in every community across the Nation. If you want to verify this, I urge you to go back to your offices and check the yellow pages in the phone book for your State. What you will find is that the alarm security services are widely and competitively available.

What is less apparent is that this highly competitive, \$10 billion industry is not dominated by large companies. Instead, it is dominated by small businesses which employ on average less than 10 workers. There are over 13,000 alarm companies across the Nation. The top 100 control less than 25 percent of the marketplace and the 100th largest company has annual revenues of less than \$3 million a year. The eight largest companies control merely 11 percent of the marketplace.<sup>3</sup>

---

<sup>3</sup> 141 Cong. Rec. S8310, 8355 (June 14, 1995) (statement of Sen. Harkin) (emphasis added).



More than 99 percent of the 13,000 alarm companies have revenues of less than \$9 million<sup>4</sup> -- the threshold for the definition of a "small business" under the Standard Industrial Classification (SIC) 7382<sup>5</sup> for "Security Systems Services."<sup>6</sup> Thus, more than 99 percent of alarm companies qualify as small businesses under the SBA's definition of small business, and therefore qualify as small businesses under the Regulatory Flexibility Act.<sup>7</sup>

Senator Harkin further explained:

Many of these businesses epitomize the American dream. Alarm companies are started by people with all kinds of backgrounds. A military veteran who learned electronics in the service, someone who worked in the building trades, or a retired police officer, they start their own businesses; they work hard; they succeed; and they want to pass on their business to their children. . . .

Furthermore, no single individual or group of companies has the ability to set the price in the marketplace. It is the American consumer who has the most to lose because the consumer benefits from this competitive marketplace. Over the past decade, the

---

<sup>4</sup> See STAT Resources, Inc., The U.S. Burglar Alarm Market: Characteristics and Trends (1992) (available from STAT Resources, Inc., Boston, MA).

<sup>5</sup> Office of Management and Budget, Executive Office of the President, Standard Industrial Classification Manual 368 (1987).

<sup>6</sup> 61 Fed. Reg. 3293 (1996) (to be codified at 13 C.F.R. § 121.201) (giving \$9 million as SBA's small business definition for SIC 7382).

<sup>7</sup> See NPRM paras. 290, 325. Even if SIC 4813 (for telephone companies) were applied to alarm companies, more than 99% of alarm companies would qualify as small businesses because more than 99% of alarm companies have fewer than 1500 employees. See The U.S. Burglar Alarm Market, Characteristics and Trends, *supra* note 4; NPRM para. 325 (1500 employee threshold for SIC 4813).

average price of the installation of a home security system has declined 40 percent. Today, you can have a system installed in your home for as little as \$200, and some companies are even offering free installation in order to promote alarm monitoring services.

The alarm industry also has an excellent job creation record. Over the past 20 years, the alarm industry has more than tripled employment from 40,000 jobs to well over 140,000 jobs.<sup>8</sup>

In addition to the small size of its thousands of competing firms, the other primary characteristic of the alarm industry is the dependence of its members upon telecommunications facilities and services for the monitoring of their business and residential systems. Because telecommunications facilities and services are an essential element of alarm service, any significant increase in the cost thereof -- for example, from the imposition of access charges upon alarm companies -- will have a substantial adverse impact upon thousands of small businesses with minimal profit margins. Because of the large number of competitors, many of these small businesses will not be able to raise their prices immediately in response to the cost increase, but rather will have to reduce other costs or investments, and hope to ride out the storm. Ultimately, the impact will be a further transfer of resources to local exchange carriers, and a decrease in the amount or quality of the public safety services provided by alarm companies. As noted by IIA:

[R]equiring information service providers to allocate a portion of their resources to access charges as

---

<sup>8</sup> 141 Cong. Rec. S8310, 8355 (June 14, 1995) (statement of Sen. Harkin) (emphasis added).

currently defined would be detrimental to most small and emerging information service companies, whose profit margins are extremely narrow. To require them to subsidize other industries or pay inflated costs would threaten their growth by misallocating financial resources that could otherwise be used to invest in new technologies. Such a policy would be inconsistent with the 1996 Act's mandate of promoting competition within the industry by allowing nascent companies to develop and invest in new technologies, thereby providing consumers with modern services at lower costs."<sup>9</sup>

In sum, the Congressional goals in enacting the 1996 Act included promoting competition and preserving the vitality of the small businesses that comprise the alarm industry. Because the imposition of access charges could be detrimental to these small businesses, the FCC should not impose access charges on alarm companies.

2. **ALARM COMPANIES HAVE A NATURAL NEED TO MINIMIZE THEIR USE OF THE SWITCHED TELEPHONE NETWORK**

Another reason for inclusion of the alarm monitoring services provision in the 1996 Act was the need for alarm companies to provide reliable service. Senator Harkin stated:

This is a very vibrant sector of the American economy. So vigorous [that] alarm industry competition benefits the consumer in another way -- the development of an industry-wide culture which promotes prompt, reliable service.

This is vitally important in an industry where the service involved is a protection of life, safety, and property in one's home or business. Knowing that a service person will be there next week sometime in the morning or afternoon is not good enough. Consumers benefit from the knowledge that if they do not like the service they are receiving, there is always another

---

<sup>9</sup> IIA Comments at 4.

alarm company that will provide the service they want and need at a competitive price.<sup>10</sup>

This need to provide reliable service results in sparing use of the telephone network. Central stations need to receive alarm information in order to ensure that the appropriate police, fire or other emergency personnel are dispatched to the customer's premises. A business experiencing a burglary, or a residence on fire, cannot afford to have its alarm system call the central station only to receive a busy signal. The call must go through.

Several standards therefore have been developed for determining the number of incoming lines at a central station based on the number of alarm systems served by that central station. For example, the National Fire Protection Association's National Fire Alarm Code requires two lines to support up to 500 alarm systems, and three lines to support up to 1,500 alarm systems.<sup>11</sup> Underwriters Laboratories, Inc. has developed similar standards for the number of incoming lines at a central station based on the number of alarm systems served by that central station.

These standards translate into very low daily usage of the incoming lines to a central station. Calls made via the PSTN from burglar and fire alarms to alarm company central stations work as follows: A burglar or fire alarm dials the central

---

<sup>10</sup> 141 Cong. Rec. S8310, 8355 (June 14, 1995) (statement of Sen. Harkin) (emphasis added).

<sup>11</sup> National Fire Protection Ass'n, National Fire Alarm Code 72-54 (1996) (enclosed as Exhibit 1).

station, sends data concerning the location and nature of the emergency, and hangs up. This process takes anywhere from approximately 8 seconds (for newer equipment) to 30 seconds (for older equipment).

By combining the average call length with the standards mentioned above, worst-case scenarios can be developed. For example, assume that: (a) a central station has three incoming lines and serves 1,500 alarm systems; (b) each alarm call takes 30 seconds; and (c) each alarm system activates five times per year. Then each line would answer an average of 7 calls per day,<sup>12</sup> for a total average usage of 3.5 minutes per line per day. Even if some of these 1,500 systems were to run daily self-tests (which only a small percentage of alarm systems do), the usage still is low. For example, if 10 percent of the 1,500 systems performed daily self-tests, each line would answer an average of 57 calls per day,<sup>13</sup> for a total average usage of 28.5 minutes per line per day.

In sum, the need to provide reliable service results in daily PSTN usage that can be measured in minutes.

---

<sup>12</sup> (1,500 systems x 5 calls per year / 365 days per year / 3 incoming lines).

<sup>13</sup> ( ((1,500 systems x 5 calls per year) + (150 systems doing daily self-tests x 365 days per year)) / 365 days per year / 3 incoming lines).

**B. THE USE OF THE PSTN BY ALARM COMPANIES IS MUCH LOWER THAN THE USE OF THE PSTN BY OTHER ESPS**

This limited use of the PSTN is much lower than the usage of the PSTN by Internet service providers.

As noted above, alarm companies may have from 3.5 minutes to 28.5 minutes of use per line per day -- a very small amount in comparison to the almost eight hours of use per line per day reported by CompuServe for incoming calls to its online service.<sup>14</sup> Additionally, the duration of alarm calls is getting shorter over time. This is in stark contrast to the recent surge in the use of America Online by its existing customers, and LEC projections of increased Internet usage within the next few years.<sup>15</sup> Furthermore, many alarm systems -- namely, those that make shorter calls, perform self-tests at less frequent intervals, or activate fewer times each year -- make less use of the incoming lines at the central station than the 3.5 minutes or 28.5 minutes of daily per-line use estimated above.

Likewise, alarm company use of the PSTN does not approach the level of usage by providers of interstate voice telephony.<sup>16</sup> This is true despite the implied claims of AT&T that ESP use of

---

<sup>14</sup> Compuserve, Inc. and Prodigy Servs. Corp. Comments at 11 n.25.

<sup>15</sup> See NPRM para. 285.

<sup>16</sup> See id. para. 286 (comparing ESPs to providers of interstate voice telephony).

the PSTN is similar to that of interexchange carriers.<sup>17</sup> AT&T provides no support for this allegation. As demonstrated above, alarm calls are short, and few and far between. Thus, AT&T's assertions about the use of the PSTN by ESPs is wrong.

In sum, even if the Commission were to consider imposing access charges on other ESPs, such as Internet service providers, access charges would not be appropriate for alarm companies whose calls are short and getting shorter, whose daily usage is low, and whose usage of the PSTN is limited by the need for the alarm systems to obtain non-busy lines at the central station. Alarm calls are not contributing to the PSTN congestion allegedly experienced by the LECs.<sup>18</sup> In addition, alarm companies have not contrived to carry voice traffic, and thus have not contributed to the unfair competition that some commenters have decried.<sup>19</sup> Thus, there can be no justification to impose access charges on alarm companies.

**C. IMPOSITION OF ACCESS CHARGES WOULD BE PREMATURE**

In any event, the imposition of access charges at this time would be premature for at least two reasons. First, the Commission has not received the information it requested in the NOI, and thus does not have the data to consider LEC revenues

---

<sup>17</sup> AT&T Comments at 72.

<sup>18</sup> NPRM n.386.

<sup>19</sup> See Telecommunications Resellers Ass'n Comments at 40; General Communications, Inc. Comments at 8,9.

attributable to ESPs, the usage of the PSTN by ESPs, and how that usage differs among ESPs. Second, as the Commission noted, the existing access charge system includes non-cost-based rates and rate structures.<sup>20</sup> As noted by the ISA, "[a]pplying existing access charges to the information services industry could undermine the progress and development of the industry."<sup>21</sup>

In sum, without detailed analysis of network usage by ESPs and the associated revenues, and without the development of cost-based access charges and experience in their implementation, there can be no rational basis for imposing access charges on ESPs such as alarm companies at this time.

**III. SUBSCRIBER LINE CHARGES SHOULD REMAIN CAPPED AND ASSESSED ON A PER-FACILITY BASIS [NPRM paras. 64-70]**

AICC concurs with those commenters who object to the Commission's proposal to lift the existing cap on the SLC.<sup>22</sup> This proposal is inconsistent with the goals of this proceeding. Until local competition is fully developed, LECs with market power will seek other sources of revenue to replace access charges; increasing the uncapped SLC on multi-line businesses, such as ESPs, will be an obvious solution. If the Commission were to allow this to happen, the higher SLCs will nullify the

---

<sup>20</sup> NPRM para. 288.

<sup>21</sup> ISA Comments at 2.

<sup>22</sup> See American Petroleum Inst. Comments at 45; Commercial Internet Exchange Ass'n Comments at 13; Pennsylvania Internet Serv. Providers Comments at 9.



access charge exemptions for ESPs.

AICC also agrees with those LECs that support a rule that would assess one SLC for each pair of copper wires, or one SLC for each ISDN facility.<sup>23</sup> Alarm companies often use derived channels so that alarm systems may communicate with the central station while the customer continues to make use of the telephone line. Alarm companies also use Basic Rate Interface (BRI) ISDN lines for video connections to customers' premises. The use of ISDN lines is expected to grow as higher quality video is supported on ISDN lines. AICC is concerned that increased SLCs could deter the deployment of derived channels and ISDN lines. GTE and Cincinnati Bell Telephone Company (CBT) agree.<sup>24</sup>

AICC submits that imposition of multiple SLCs on derived channels and ISDN lines would not reflect actual costs. As Ameritech stated: "Charging SLCs on a derived channel basis would substantially over-recover loop costs from ISDN subscribers."<sup>25</sup> CBT also states that the "per-facility approach recognizes that the costs incurred by LECs to provide ISDN and other derived channel services are not dependent on the number of channels and, thus, would allow LECs to price these services closer to their true economic cost."<sup>26</sup>

---

<sup>23</sup> GTE Comments at 32-33; see also NPRM para. 69.

<sup>24</sup> GTE Comments at 33-35; CBT Comments at 8-9.

<sup>25</sup> Ameritech Comments at 13.

<sup>26</sup> CBT Comments at 8.

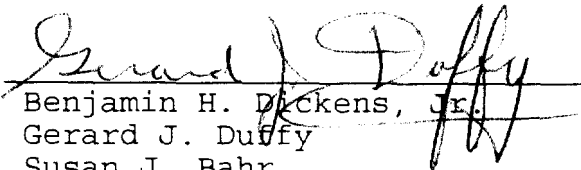
In sum, the Commission should retain a cap on the SLC in order to ensure that LECs do not use SLCs as a substitute for access charges. Additionally, the Commission should prohibit LECs from assessing more than one SLC per facility, because to do otherwise would be not be cost-causative.

#### **CONCLUSION**

For these reasons, AICC respectfully submits that the Commission should not impose access charges on alarm companies. Even if the Commission were to consider imposing access charges on Internet service providers, such access charges should not be imposed on alarm companies due to their lesser use of the PSTN and the Congressional goals of supporting competition and preserving the vitality of the alarm industry. For the same reasons, the Commission should not lift the existing cap on SLCs and should not permit LECs to apply more than one SLC per pair of copper wires or per BRI ISDN line.

Respectfully submitted,

#### **ALARM INDUSTRY COMMUNICATIONS COMMITTEE**

By   
Benjamin H. Dickens, Jr.  
Gerard J. Duffy  
Susan J. Bahr

Blooston, Mordkofsky, Jackson & Dickens  
2120 L Street, NW - Suite 300  
Washington, DC 20037  
(202) 659-0830

Its Attorneys

February 14, 1997

**EXHIBIT**

Table 4-5.3.2.2.3 Loading Capacities for Hunt Groups

System Loading at the Supervising Station	Number of Lines in Hunt Group				
	1	2	3	4	5 to 8
<b>With DACR lines processed in parallel</b>					
Number of initiating circuits	N/A	5000	10,000	20,000	20,000
Number of DACTs <sup>1</sup>	N/A	500	1500	3000	3000
<b>With DACR lines processed serially (put on hold, then answered one at a time)</b>					
Number of initiating circuits	N/A	3000	5000	6000	6000
Number of DACTs <sup>1</sup>	N/A	300	800	1000	1000

N/A: Not acceptable.

<sup>1</sup>Table 4-5.3.2.2.3 is based on an average distribution of calls and an average connected time of 30 seconds for a message. The loading figures in the table presume that the lines are in a hunt group (i.e., DACT can access any available line). Note that a single-line DACR is NOT ACCEPTABLE (N/A) for any of the configurations shown.

- (a) Current on each circuit under normal conditions;
- (b) Current on each side of the circuit with the receiving equipment conditioned for an open circuit.

NOTE: The current readings in accordance with 4-5.3.3.1.4(a) should be compared with the normal readings to determine if a change in the circuit condition has occurred. A zero current reading in accordance with 4-5.3.3.1.4(b) indicates that the circuit is clear of a foreign ground.

#### 4-5.3.3.2 Transmission Channels.

4-5.3.3.2.1 Circuits between the protected premises and the supervising or subsidiary station that are essential to the actuation or operation of devices initiating a signal indicative of fire shall be so arranged that the occurrence of a single break or single ground fault does not prevent transmission of an alarm.

*Exception No. 1: Circuits wholly within the supervising or subsidiary station.*

*Exception No. 2: The carrier system portion of circuits.*

4-5.3.3.2.2 The occurrence of a single break or a single ground fault on any circuit shall not of itself cause a false signal that could be interpreted as an alarm of fire. Where such single fault prevents the normal functioning of any circuit, its occurrence shall be indicated automatically at the supervising station by a trouble signal compelling attention and readily distinguishable from signals other than those indicative of an abnormal condition of supervised parts of a fire suppression system(s).

4-5.3.3.2.3 The circuits and devices shall be arranged to receive and record a signal readily identifiable as to location of origin, and provisions shall be made for equally identifiable transmission to the public fire service communications center.

4-5.3.3.2.4 Multipoint transmission channels between the protected premises and the supervising or subsidiary station and within the protected premises, consisting of one or more coded transmitters and an associated system unit(s), shall meet the requirements of either 4-5.3.3.2.5 or 4-5.3.3.2.6.

4-5.3.3.2.5 Where end-to-end metallic continuity is present, proper signals shall be received from other points under any one of the following transmission channel fault conditions at one point on the line:

- (a) Open; or
- (b) Ground; or
- (c)\* Wire-to-wire short; or
- (d) Open and ground.

4-5.3.3.2.6 Where end-to-end metallic continuity is not present, the nonmetallic portion of transmission channels shall meet all of the following requirements:

(a) Two nonmetallic channels or one channel plus a means for immediate transfer to a standby channel shall be provided for each transmission channel, with a maximum of eight transmission channels being associated with each standby channel, or shall be provided over one channel, provided that service is limited to one plant.

(b) The two nonmetallic channels (or one channel with standby arrangement) for each transmission channel shall be provided by one of the following means, shown in descending order of preference:

1. Over separate facilities and separate routes; or
2. Over separate facilities in the same route; or
3. Over the same facilities in the same route.

(c) Failure of a nonmetallic channel or any portion thereof shall be indicated immediately and automatically in the supervising station.

(d) Proper signals shall be received from other points under any one of the following fault conditions at one point on the metallic portion of the transmission channel:

1. Open; or
2. Ground; or
- 3.\* Wire-to-wire short.

#### 4-5.3.3.3 Loading Capacity of McCulloh Circuits.

4-5.3.3.3.1 The number of transmitters connected to any transmission channel shall be limited to avoid interference. The total number of code wheels or equivalent connected to a single transmission channel shall not exceed 250. Alarm signal transmission channels shall be reserved exclusively for fire alarm signal transmitting service.

*Exception: As provided in 4-5.3.3.3.4*

4-5.3.3.3.2 The number of waterflow switches permitted to be connected to actuate a single transmitter shall not exceed five switches.